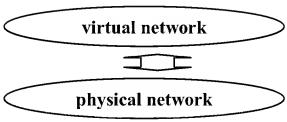
Remarks

Claims 1-9 are pending in the application. Claims 1-4, 6 and 7 are rejected. Claims 5, 8 and 9 are objected to. All rejections and objections are respectfully traversed. The claims are amended to make the limitations more definite, and not to change the scope of what is claimed. Claims 10 and 11 are new, but do not claim new subject matter.

4. **Claims 1-2, 4, and 7** are rejected under 35 U.S.C. 102(e) as being anticipated by Varadarajan et al. (PG Pub US 2004/0255323 A1).

Applicants take note that there is no "standard" that defines the details of an *overlay network*. The closest generally accepted definition at a highest level is that an overlay network is a *virtual* network that is built *on top* of a *physical* network.



Nodes in the overlay network can be thought of as being connected by virtual or logical links, each of which corresponds to a path, perhaps through many physical links, in the physical network. For example, overlay networks include: peer-to-peer networks, dial-up Internet, Akamai, End System Multicast, Overcast for multicast, and RON (Resilient Overlay Network) for resilient routing. Beyond that, in terms of what the nodes are and how they

operate, varies widely. Hence, node names in different overlay networks are often confusing and, at worst, conflicting. Different overlay networks implement server, client, core, and edge nodes in different incompatible configurations, cf. Varadarajan and the present invention.

The network described by Varadarajan includes:

a streaming overlay network (SON) that includes:

edge nodes 108, and

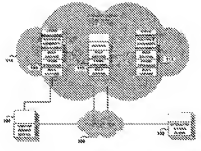
core nodes 110;

client nodes 102 *outside* the SON;

server nodes 104 *outside* the SON; and

the Internet 106 *outside* the SON.

Effectively, the edge nodes are at the periphery of the overlay network, see Figure 1.



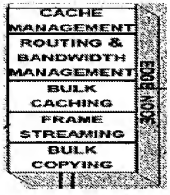
In Varadarajan, the client nodes, server nodes and the Internet are connected to the core nodes of the overlay network by the edge nodes, see Figure 2. The server nodes and the edge nodes are clearly distinguished in Varadarajan.

In Varadarajan, the core nodes monitor QoS metrics and communicate the metric to the edge nodes. The edge nodes maintain the metrics in a connectivity matrix 408. The matrix has entries for bandwidths between source nodes and destination nodes, see Figure 4 and the following:

> [0039] The edge nodes not only load the core nodes but also maintain the status of various core nodes and their associated links. This is facilitated by the self-monitoring aspect of the core nodes and these nodes communicate health messages at regular intervals to the edge nodes. Also, a core node monitors its neighbors and communicates their status to the edge nodes.
>
> [0050] The Connectivity/Available Bandwidth Matrix (ABW), maintained by each edge node, contains the available bandwidth between a pair nodes that are directly connected via a link.

Thus, the edge nodes maintain a matrix of AWB for source/destination pairs, and the BW table of bandwidths for each individual node. The selection of paths is performed by a routing and bandwidth management element of the edge nodes, see Figure 1 and the following:

> [0041] An interactive video client (102) interacts with a video server (104) via an IP network such as Internet/intranet (106) to request for a video. This request is communicated to the source edge node (108) by the video server. The main components of an edge node (108 and 112) are: (d) Routing and Bandwidth Management--to maintain the status of the SON along with the bandwidth availability and connectivity information…



Varadarajan does show a link correlation matrix and the path correlation matrix in his server.

In Varadarajan, the client and server are outside the overlay network. In contrast, claimed is an overlay network where the server and client are inside the overlay network.

In Varadarajan, the core and edge nodes measure QoS. In contrast, claimed are client and server nodes measuring QoS.

In Varadarajan, the QoS metrics are communicated to the edge nodes, maintained by the edge nodes, and the edge nodes select the paths. In contrast, claimed are server nodes that receive and maintain QoS metrics, and perform the path selection.

Varadarajan does describe, disclose, show, teach or otherwise suggest any of the claimed limitations. Varadarajan can never anticipate what is claimed.

In Varadarajan, the status is maintained continuously. In contrast, the claimed steps are performed periodically.

Continuous: marked by uninterrupted extension in space, time, or sequence.

Periodic: occurring from time to time

Under MPEP 2111.01, the plain meanings of continuous and periodic are different.

5. **Claim 1** is rejected under 35 U.S.C. 102(e) as being anticipated by Perkins et al. (US Patent No. 6,930,983 B2).

Perkins does not describe an overlay network as known in the art, see above. Perkins is inappropriate art. Perkins describes a conventional packet network without a virtual overlay. In Perkins, the QoS metrics are measured by source nodes 113. The hop table in Perkins indicates the number of hops (distance) between nodes. The number of hops says nothing about the quality of service on the hops. The route selection in Perkins is entirely distance based (number of hops), e.g., shortest route. Nowhere, does Perkins select routes based on QoS.

7. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Varadarajan et al. further in view of Menon et al. (PG Pub US 2002/0152318 A1).

As stated above, Varadarajan describes none of the claimed limitations. In Varadarajan, the video cache is in the core and edge nodes.

> [0041] The main components of an edge node (108 and 112) are: (c) Bulk Caching--storing of a received video file in the local storage of a node for forwarding and streaming purposes. main components of a core node (110) are: (c) Bulk Caching--to store the received video files in the local storage for forwarding and streaming purposes.

The content of Menon is also not stored on a server of an overlay network.

8. **Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varadarajan et al. further in view of Klinker et al. (PG Pub US 2003/0088671 A1).**

Klinker does not describe QoS metrics in a server node of an overlay network. Paragraph [055] describes rules, not measuring metrics including bandwidth, latency, and packet loss rate of the link. Paragraph [056] describes detecting violated rules and taking remedial action.

It is believed that this application is now in condition for allowance. A notice to this effect is respectfully requested. Should further questions arise concerning this application, the Examiner is invited to call Applicants' attorney at the number listed below. Please charge any shortage in fees due in connection with the filing of this paper to Deposit Account 50-0749.

Respectfully submitted,
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